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Overview

2 minute read

Distributed tracing enables users to track a request through mesh that is distributed across multiple services. This allows a deeper understanding about request latency, serialization and parallelism via visualization.

Istio leverages Envoy's distributed tracing feature to

provide tracing integration out of the box. Specifically, Istio provides options to install various tracing backend and configure proxies to send trace spans to them automatically. See Zipkin, Jaeger and Lightstep task docs about how Istio works with those tracing systems.

Trace context propagation

Although Istio proxies are able to automatically send spans, they need some hints to tie together the entire

trace. Applications need to propagate the appropriate HTTP headers so that when the proxies send span information, the spans can be correlated correctly into a single trace.

To do this, an application needs to collect and propagate the following headers from the incoming request to any outgoing requests:

- `x-request-id`
- `x-b3-traceid`
- `x-b3-spanid`
- `x-b3-parentspanid`

- `x-b3-sampled`
- `x-b3-flags`
- `x-ot-span-context`

Additionally, tracing integrations based on `OpenCensus` (e.g. Stackdriver) propagate the following headers:

- `x-cloud-trace-context`
- `traceparent`
- `grpc-trace-bin`

If you look at the sample Python `productpage` service, for example, you see that the application extracts the

required headers from an HTTP request using OpenTracing libraries:

```
def getForwardHeaders(request):
    headers = {}

    # x-b3-*** headers can be populated using the opentracing sp
an
    span = get_current_span()
    carrier = {}
    tracer.inject(
        span_context=span.context,
        format=Format.HTTP_HEADERS,
        carrier=carrier)

    headers.update(carrier)

    # ...
```

```
    incoming_headers = ['x-request-id', 'x-datadog-trace-id', 'x
-datadog-parent-id', 'x-datadog-sampled']

    # ...

    for ihdr in incoming_headers:
        val = request.headers.get(ihdr)
        if val is not None:
            headers[ihdr] = val

    return headers
```

The reviews application (Java) does something similar using `requestHeaders`:

```
@GET
@Path("/reviews/{productId}")
public Response bookReviewsById(@PathParam("productId") int prod
uctId, @Context HttpHeaders requestHeaders) {

  // ...

  if (ratings_enabled) {
    JsonObject ratingsResponse = getRatings(Integer.toString(pro
ductId), requestHeaders);
```

When you make downstream calls in your applications, make sure to include these headers.